इंटरनेट मानक

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"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
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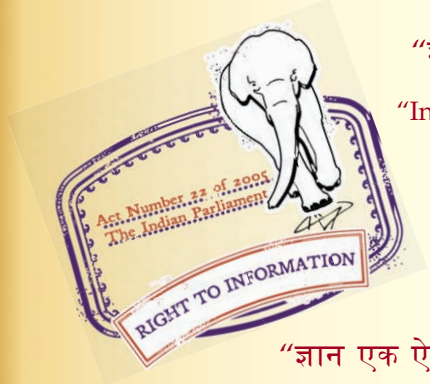
IS 5414 (1995): Gaskets and Packings - Gland Packing Jute and Hemp [MED 30: Gaskets and Packing]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 5414 : 1995
(Reaffirmed 2001)

भारतीय मानक

गैस्केट तथा पैकिंग — जूट व सन की पैकिंग — विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

GASKETS AND PACKINGS — GLAND PACKING JUTE AND HEMP — SPECIFICATION

(First Revision)

UDC 621·643·44 : 621·762·4

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 1995

Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Gaskets and Packings Sectional Committee had been approved by the Light Mechanical Engineering Division Council.

This standard was originally published in 1969 and the present revision incorporates changes necessitated due to the difficulties encountered in the implementation of the standard. Some of the major modifications are:

a) Three grades of gland packings have been specified instead of earlier classification. Jute packings have been brought under a single type instead of three types specified earlier.

b) Materials for flax, hemp and gland packings have been specified separately.

c) Graphite and mica contents have been specified independent of the lubricant content in the packing.

d) Petroleum jelly and lime based grease have also been permitted to be used as lubricants for the manufacture of packings.

e) Detailed method for determining lubricant, graphite and mica have been included.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

GASKETS AND PACKINGS — GLAND PACKING JUTE AND HEMP — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard covers the requirements of jute, hemp and flax packing intended for use in general water services, medium and heavy duty hydraulic cylinders, reciprocating pumps, stern glands, rods and valve steam under the following conditions:

a) Hot and cold water up to 21 kg/cm^2 pressure, and

b) Fuel oil up to 35 kg/cm^2 pressure.

2 GRADE AND SHAPE

2.1 The gland packings covered by this standard shall be of three grades:

Grade I — Flax gland packings

Grade II — Hemp gland packings

Grade III — Jute gland packings

2.2 In most of the cases these packings are in square shapes but it may also be in round shape if desired by the purchaser.

3 MATERIAL AND CONSTRUCTION

3.1 Flax Gland Packings

The material shall be made by braiding flax yarn over twisted or braided flax yarn packing or over flax rovings depending on the pressure required. The straight ends in the centre and corners shall not exceed 25 percent of the total weight of the packing for ordinary square braided packings and 30 percent for lattice/duplex braided packings. For extreme high pressure condition, duplex/lattice braided packing is essential.

To ensure uniform dispersion the yarn shall be impregnated with lubricant and graphite or mica prior to or during braiding.

3.2 Hemp Gland Packing

The material shall be made by braiding cleaned hemp yarn over twisted or braided hemp packings or yarn or over hemp rovings to the required sizes as specified by the customer.

The straight ends in the centre and corners shall not exceed 25 percent of the total weight of the packing for ordinary square braided packings and 30 percent for lattice/duplex braided packings. For extreme high pressure condition, duplex/lattice braiding packing is essential.

To ensure uniform dispersion the yarn shall be impregnated with lubricant and graphite or mica prior to or during braiding.

3.3 Jute Gland Packing

The packing shall be made by braiding jute yarn having 3 ply and having minimum number of twists per metre of 82 over twisted or braided jute packing or yarn or over jute rovings depending on the required pressure to the required sizes as specified by the customer.

The straight ends of the centre and corners shall not exceed 25 percent of the total weight of the packing for ordinary square braided packings and 30 percent for lattice/duplex braided packings.

For extreme high pressure condition, lattice/duplex braiding is necessary.

To ensure uniform dispersion the yarn shall be impregnated with lubricant and graphite or mica prior to or during braiding.

4 REQUIREMENTS

4.1 Fibre Strength and Yarn Content

The strength of the fibre shall not be less than 100 kilogram force per gram per centimetre of length when tested.

The yarn content of the packing shall not be less than 40 percent by mass.

4.2 Lubricants

The lubricant may be refined mutton tallow with a percentage of free acid (expressed as oleic acid) not exceeding one percent at the time of manufacture. Petroleum jelly or lime base grease having acid value of 1 *Max* and saponification value of 5 *Max* may also be used.

The lubricant content of the finished packing shall be between 25 percent to 45 percent by weight when tested according to the method given in **A-1**.

4.3 Graphite or Mica

The graphite should be more than 90 percent of carbon content and not coarser than 75 microns and mica shall not be coarser than 150 microns. The graphite or mica content should be between 5 to 15 percent by weight when tested according to the method given in **A-2**.

4.4 Dimensions

The size of the packing shall not vary in thickness in any direction by more than the following:

Size	*Variation*
Up to and including 12 mm	±0·5 mm
Over 12 mm	±1 mm

4.5 Weight

The weight per metre of the hemp, jute or flax packing in kilograms shall not exceed $1{\cdot}37 \times 10^3 S^2$, where S is the length of the side of the cross section of the packing in metres.

5 WORKMANSHIP

The packing shall show no evidence of poor workmanship. The surface of the packings shall not have torn out threads.

6 SAMPLING

6.1 Lot

The quantity of coils of packings of the same size, designation and of one definite quality, delivered to one buyer against one despatch note shall constitute a lot.

6.2 The conformity of a lot to the requirement of this standard shall be determined on the basis of tests carried out on the sample selected from the lot.

6.3 Unless otherwise agreed to between the manufacturer and the purchaser the number of coils to be selected at random from a lot shall be in accordance with col 1 and 2 of Table 1.

7 TESTS

7.1 Visual and Dimensional Inspection

Each coil of packing selected in accordance with col 2 of Table 1 shall be inspected for the construction, workmanship and dimensions. The dimensions shall be measured carefully without applying pressure to an accuracy of 0·1 mm with a slide gauge, at least at six different positions along the length. The mean of the six measurements thus made shall be within the variation specified in **4.4**. The number of permissible defects shall not be more than that specified in col **3** of Table 1.

Table 1 Sample Size and Criteria for Conformity

(*Clauses* 6.3 *and* 7.1)

No. of Coils in the Lot	Sample Size	Acceptance Number for Visual and Dimensional Inspection
(1)	(2)	(3)
Up to 100	8	0
101 to 300	13	1
301 ,, 500	20	1
501 ,, 1 000	32	2
1 001 and above	50	3

8 MARKING

8.1 Each coil of the packing shall be marked with the following:

a) Manufacturer's name or trade-mark,

b) Dimensions of packing,

c) Lot number/Batch number, and

d) Month and year of manufacture.

8.2 BIS Certification Marking

The product may also be marked with Standard Mark.

8.2.1 The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

9 PACKAGING

9.1 The bundles/coils shall be packed, sealed in parcels of suitable size and shall be adequately protected against damage and ingress of dust during transit.

ANNEX A

(*Clauses* 4.2 *and* 4.3)

METHODS OF TESTS FOR LUBRICANT GRAPHITE AND MICA CONTENT IN GLAND PACKINGS

A-1 DETERMINATION OF LUBRICANT CONTENT

A-1.1 Procedure

A-1.1.1 Take a Soxhlet thimble and Whatman's filter paper of 10 cm diameter, previously extracted with carbon tetrachloride and place them in a weighing bottle.

A-1.1.2 Place the weighing bottle (with the thimble and filter paper) with the lid offset in an oven maintained between 105°C and 110°C for one hour. Replace the lid and cool in a dessicator to room temperature and weigh.

A-1.1.3 Unplait a representative section of the packing not less than 5 g in mass, over the open filter paper so that all material which are dislodged fall on the filter paper.

A-1.1.4 Wrap the sample in the filter paper and insert into the thimble. The thimble with the filter paper and sample should be replaced in the weighing bottle which should once again be dried in the oven for one hour as before and cooled in a dessicator to room temperature and weighed.

A-1.1.5 Place thimble with the sample wrapped in the filter paper in a Soxhlet extraction apparatus fitted with a water cooled liebeg condenser.

A-1.1.6 Extract for one hour (or more till the extraction is colourless) with carbon tetrachloride. The volume of the solvent to be used should be at least three times the capacity of the Soxhlet extractor.

A-1.1.7 Dry an evaporating basin in an oven at 105°C for one hour, cool to room temperature in a dessicator and weigh.

A-1.1.8 Transfer the solution from the extraction flask to the basin. Rinse the flask with a small quantity of fresh carbon tetrachloride and transfer to the basin.

A-1.1.9 Place the basin and its contents in an oven for half an hour at 105°C. Cool in a dessicator to room temperature and weigh.

A-1.2 Calculation

$$\text{Grease/oil content, percent} = \frac{W_4 - W_3}{W_2 - W_1} \times 100$$

where

W_1 = mass of weighing bottle, thimble and filter paper (*see* **A-1.1.2**);

W_2 = mass of weighing bottle, thimble and filter paper with sample (*see* **A-1.1.4**);

W_3 = mass of dry evaporating basin; and

W_4 = mass of evaporating basin with extract.

A-2 DETERMINATION OF GRAPHITE OR MICA CONTENT

A-2.1 Procedure

A-2.1.1 Dry the Soxhlet thimble and its contents after extraction carried out as given under **A-1.1.6** in an oven maintained at 105°C to 110°C for one hour and cool in a dessicator to room temperature.

A-2.1.2 Take filter paper and contents, open the filter paper and carefully dislodge the graphite or mica on the filter paper by gently untwisting the yarn.

A-2.1.3 Discard the yarn.

A-2.1.4 Weigh the weighing bottle with filter paper and graphite or mica.

A-2.2 Calculation

$$\text{Graphite or mica content, percent} = \frac{W_5 - W_1}{W_2 - W_1} \times 100$$

where

W_5 = mass of weighing bottle, thimble and filter paper with graphite or mica; and

W_1 and W_2 are same as defined in **A-1.2**.